

# Homburg-Spa

An Introduction  
to its waters and their use  
by  
Dr. Arnold Schetelig

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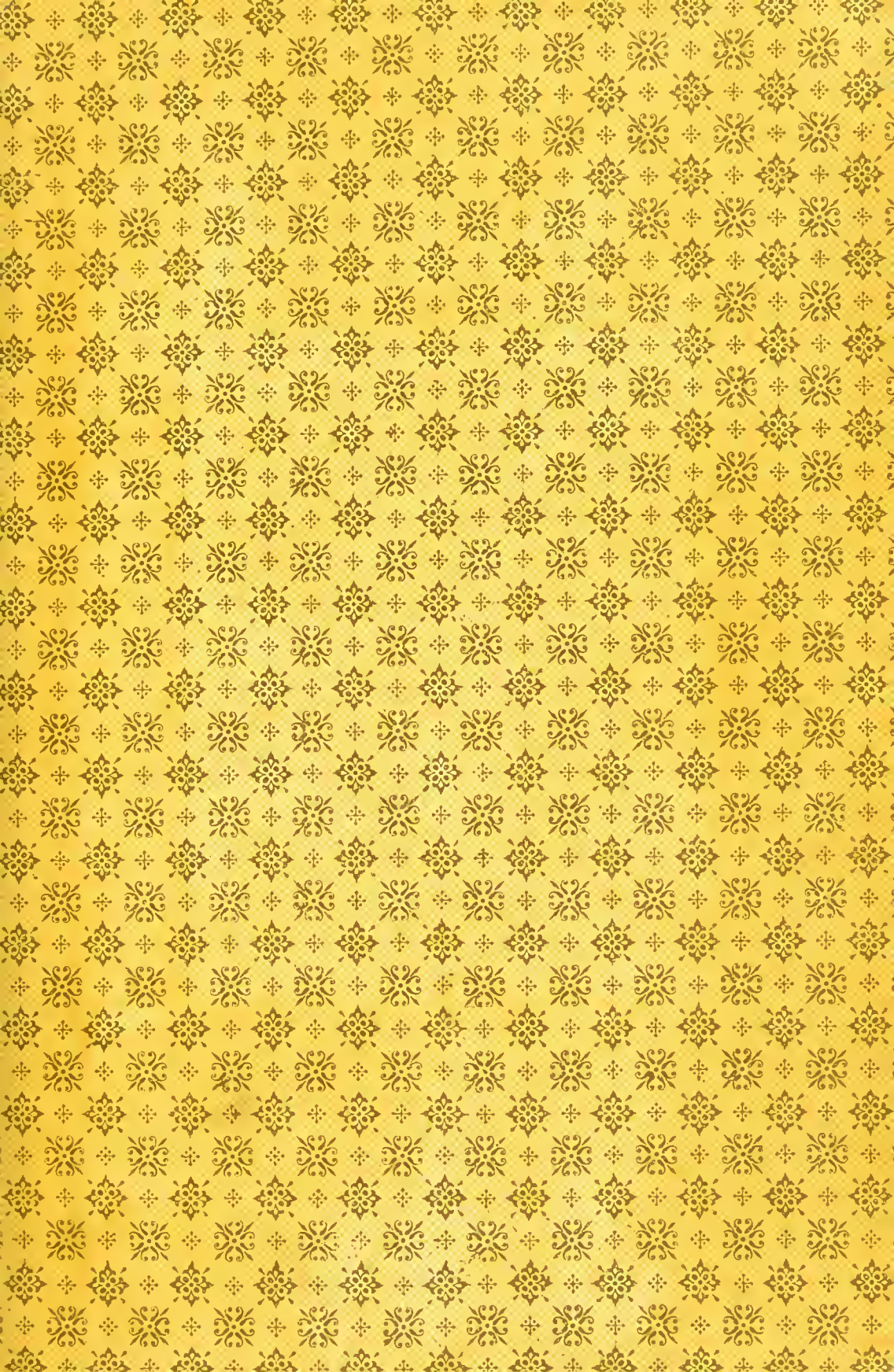


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# HOMBURG-SPA

AN INTRODUCTION  
TO ITS WATERS AND THEIR USE

BY

**DR. ARNOLD SCHETELIG**

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## Preface.

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This little volume is made up of notes penned during the course of 14 years and owes its appearance to the suggestion of friends across the Channel. It was originally intended for the medical reader alone. The author however has been led to revise it; and on mature consideration, though greatly reducing its size, prefers addressing himself to a somewhat more extended circle of readers, who might wish to acquaint themselves with a subject of wide and popular interest. In spite of his desire that the style of his writing should tally with this enlarged scope, he has found himself unable to forego entirely the use of technical terms. These he leaves, for the reason given above, to the kindly indulgence of the non-professional reader. He

further trusts that a careful perusal of this pamphlet will show that, though it takes its name from one watering place, it covers some part of the vast field of general hydrology and dietetic hygiene for invalids at watering places generally.

Finally, the author hopes to meet with the approval of the reader for having suppressed, with a few exceptions, quotations from other writers, and for not having particularized his own investigations on the subjects here presented.

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## Outlines of Geology.

The geological character of the Taunus\*) range on the right bank of the Rhine generally coincides with that on the left. Both are parts of a very considerable stretch of the Lower Devonian, its strata striking very nearly from E by N to W by S and falling in mostly from the N, but always at rather sharp angles and even vertically in places. River courses of a smaller order follow the length of these strata and lie in synclinal troughs, the drainage at right angles being the exception. This direction, strangely enough, is reversed in the case of the great river courses, the Rhine, the Saar, the Nahe and the Moselle. It must be supposed that the primary origin of these

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\*) »Taunus« is the latinized form of an original German word *taun*, or in modern speech *zaun*, corresponding to the English *town* and perhaps the Keltic *dun*, i. e. a walled or fenced in place on high.

consisted in rents and fissures which later on yielded to the eroding action of the waters themselves. Even to this day the hard task imposed, in a work like this, on a great water-course is visible in the Rhine from Bingen downwards, where as far as a village called Trechtingshausen for a run of about 4 miles the drop is nearly zero, and from Trechtingshausen for an equal distance the river falls 15 feet; the former corresponding to a direction of the Rhine rectangular to the fundamental strata, whilst in the latter locality it follows the striking of them or very nearly so. The stretch below Bingen is particularly adapted to show the various strata of the hills on either side exposed to view in almost vertical sections (e. g. the well known rock of the Lurley).

Turning to our own part of the Taunus as between the Rhine and the railway-line from Frankfurt to Cassel, we shall find it composed of parallel layers of slatelike Lower Devonian of different nature and hardness, the two central and highest ones being at the same time the hardest in substance and in their name of »Quarzite« showing their composition. This, so called Taunus Quarzite does not wholly

consist of compact genuine quartzite material, but includes manifold layers and nuggets of friable sandstone, which, in many instances, are washed away by underground water and then, indeed, may leave the quartzite the sole representative.

Quartzite being more subject to transversal rents and faults is also more apt to help the formation of valleys running at right angles, such as we have at Oberursel and between this and Wiesbaden. Parallelism of strata, however, partially disappears, as we proceed to the eastern outlying portions of the Taunus. Here we observe irregularity in stratification and some very bewildering bending and folding, such as has hitherto baffled all attempts at correct mapping.

Of organic life very little is to be said. The few specimens found can be summarized under the palaeozoic order, a chief representative of which is a brachiopode called *Spirifer*, with many varieties.

## The Origin of the Waters.

Many and varied have been the hypotheses as to the geological origin of the class of



mineral sources which are met with at Homburg. I shall not discuss them at length, but merely state my reasons for endorsing one of them that was put forward as early as 50 years ago, but since then has been nearly abandoned. According to this view the breaking forth of basaltic rocks in a line, as it were, from Gonzenheim to a point close to the Elisabeth spring must have been making a way for the row of Homburg mineral sources to appear; its opponents pointing out that the line claimed for these basaltic upheavals was erroneously supposed to be running in the direction given above, but is rather at almost right angles to it. The latter evidence, however, in no wise invalidates the theory of the general connection of basalt outbreaks with mineral springs which thus still remains applicable to Homburg. It is easily understood how successive shrinking and warping of the earth's crust may bring about faults of uncommon magnitude, even to a distance of several miles. We do not require such distances, since a fault of a couple of hundred feet may bring to the surface waters which chemical analysis proves to have sprung from rocks differing

entirely from those in the immediate neighbourhood.

Another link in the chain of evidence in favor of basalt upheaval being the cause of the opening up of deeper layers and the consequent unlocking of waters beneath them, is found in the presence of the same or similar eruptive masses near the salt springs of Cronthal, Neuenhain and Soden which three places lie in a straight line to the SW of the sources of Homburg.

The primary origin of the sources has been principally studied in two ways. One was this, that old wells on becoming defective had to be examined and new shafts of wood or iron sunk below the solid cemented brick chamber above. On these occasions several strata of clay and slate had to be passed, and the water issuing forth from them could be taken for the purpose of testing. A better and more scientific method was available, when during the three years following 1851 the great experimental shaft was sunk near the present dairy farm or »rose-garden«. The saline ingredients of the water raised in it were then found to increase gradually to the

amount of  $2\frac{1}{2}$  per cent down to the depth of 400 Frankfort feet, thence it continued at the same strength to a depth of 1000 feet, when it quickly fell to 2% and less, and remained at  $1\frac{1}{2}$  down to the end, 1700 feet.

These facts prove beyond doubt, that at the depth of 400 feet a strong salt spring is making its way up between two layers — which, by the bye, are here falling at about  $45^\circ$  — while a diluting water course with probably no mineral contents runs between two lower strata to meet the former at a further depth of 600 more feet. From thence we are fast losing touch with the briny spring, and the  $1\frac{1}{2}$  per cent of salt at 1700 feet is easily explained by water more highly impregnated once struck, tending by its greater specific gravity to fall to a considerable distance in the shaft, there to mix with the fresh water coming up from, or collecting in, deeper layers.

The chemical origin of the chloride of sodium is still enshrouded in mystery. It possibly does not belong to any of the Lower Devonian rocks, though latterly it has been found to exist in the green Sericite. — The



presence of iron is accounted for by the highly aërated waters in their passage eroding many of the darker ochre-stained slates, while the scarcity of magnesia will surprise no one who knows that within a great distance we here meet with no specimen of the Jurassic, Triassic or Permian.

If at Soden some waters similar in composition to those of Homburg exist with a temperature of from 25 to 30° Centigrade, this fact affords a proof of the much greater and more varying depth from which they rise, while the constant temperature of 10° C of most of our waters at Homburg assigns to them a distinct place and depth below the surface they rise from.

Nearly all Homburg springs appear at the fountain head laden with a great quantity of carbonic acid gas, something like one and a half of their own cubic volume. Only a small portion of this is combined with various ingredients of the water, while the larger quantity is only mechanically mixed with the water, and is given out gradually in bubbles. The steady rising of the spring water as also the occasional high welling up of some (e. g.

Ludwig) is easily accounted for by the action of carbonic acid, at the pressure of many atmospheres, below the surface tending to liberate itself in an upward direction. Attempts have been made, on sundry occasions, to connect this welling up and its intermittence with the state of atmospheric pressure which was supposed to bear upon the absorption by the water of a greater or smaller volume of gas. It does not require a very deep knowledge of the laws of physics to prove the error underlying this kind of explanation. For how can barometric changes which always range within fractions of one atmosphere leave a mark on a water which even at the depth of only a few feet below ground is continually holding carbonic acid at a pressure of several atmospheres?

### **The Homburg Drinking Water.**

The question of the Water Supply of Homburg began to be first discussed with greater interest about 12 years ago, when a change in the system of drainage was contemplated and the existing water supply threatened to

prove inadequate to meet increasing demands. The old sources up to that period used for all purposes were all surface water, yielding quantities varying according to the seasons of the year and apt to fall short at the very time in summer, when the great gathering of visitors made it most desirable that it should be ample. Then, as a matter of course, the possibility of obtaining water from the Taunus range presented itself and was eagerly seized upon. Two adits have been in course of construction during about two years, one below the Saalburg, the other about 500 metres to the west of the former adit, and these, though not completed to more than half of their intended length of one thousandh metres each, already yield, according to the last report — for which I am indebted to Mr. Jacobi, the originator of these works — a permanent quantity of 1350 cubic metres per diem for July and of 1150 for August.

If we take the resident population of Hom-burg to be under 9000, inclusive of a garrison of about 500 — and the visiting and floating population in July to be 3000 and in August 3500, making a total of slightly more than



12000, then these figures compared with those given above will show that the supply even during the months of drought does not fall much short of one tenth of a cubic meter of pure rock water per head per day, equal to about 35 gallons. The average daily consumption of 20 English towns\*) is just below 14 gallons a day, and this includes, as it would elsewhere, the supply to small trades and gardens and that needed for municipal sanitary purposes. The water supply of Homburg must therefore be considered very ample and will be increased when the present adits will be nearer completion. In case of accidents and unforeseen emergencies two large storage reservoirs and the former supply from torrents will always be available.

The system in use is that of the »constant service« up to an average quantity of 4 cubic metres per week per household, any delivery beyond this having to be paid for at an extra charge.

The chemical analysis of Homburg water compares favourably with that of places re-

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\*) As reported in an article on the Water Supply of London in the Quarterly Review No. 347.

nowned for the purity of their supply. So long, however, as cutting and boring has to go on, we must expect some kind of debris of rocky substance to be washed in occasionally, making the water slightly turbid. On the other hand, contamination from any organic or noxious causes or in connection with human habitations, is totally excluded.

## Description of the Sources.

The Elizabeth source is the oldest known of the Homburg springs. In ancient times it had the name of the »Lower Well«, and was reset under Landgrave Christopher in the year 1660, once more under Frederic II. 1680 and at the same time deepened. At that period it comprised three sources, one acidulated, one fresh water and one briny, all of them within the compass of 15 feet. In the year 1836 it received its present form and setting, the saltspring was carefully isolated, but had to be again laid lower in 1859. All these manipulations, however, in no way interfered with the spring itself, which has at all times been strong enough to force the water

through the ancient conduit to the surface. It is a virgin source of small depth, only about 30 feet, and springs from a bed of drift and loam. During recent years it has yielded an average quantity of 8000 litres per 24 hours.

The present Kaiserbrunnen has been established in the place of an older well, dating from 1680, which went under the name of the »Middle Well«. Its wooden frame towards 1840 was still in a good state of preservation, but the spring being refitted with an iron tube which eventually rusted and broke, was much injured. Then, in 1855, a totally new shaft had to be sunk at a distance of six feet from the old spring. This brought up, from the depth of 270 feet, water of a useful composition, and on the occasion of some repairs in 1866 the old casement was discovered with the year 1660 engraved upon it.

The Ludwig, originally a simple acidulated table water, was apparently discovered in 1809 by some boys on the edge of a brook. When, however, its first fittings were renewed in 1834, an old framework was found showing that it had a still greater antiquity. During the time that new shafts were sunk in 1842



to about 160 feet, the vein of a salt well was accidentally opened that in olden times used to be the principal source of the Homburg salt revenue, and henceforth the Ludwig spring changed its nature into a more highly mineralized water. I have no hesitation in claiming for it, on the strength of its potency, the first place among the Homburg sources.

The *Stahlbrunnen* is of a comparatively recent origin, it was opened up in 1841 at the depth of 199 feet, received a new iron tube down to the bottom in 1846—47, and on this becoming brittle through oxidation, a copper one of three inches diameter in 1856.

Of the *Louisenbrunnen* little need be said. It is a natural mineral spring of small depth. It was bored afresh and reset in 1886.

Local archeologists are fond of attributing to the Romans not only the knowledge, which is indisputable, but the medicinal use of the Homburg salt springs. Such a belief can not be countenanced by any one acquainted with their habits. The Romans used to make much use of hot baths and recognized the healing properties of hot natural springs, but salt springs to them were nothing if not the means

of setting up a salt manufactory. They evidently found the Homburg wells as they were originally worked by the native Frankish tribes and at once began working them of their own accord. This fact is clearly attested by very interesting finds near the site of the present Kaiser Wilhelm Baths, where the walls of houses and magazines, Roman pottery of some value, votary figures and coins were discovered.

Remembering the importance attaching to a salt mine for a conquering race, that held this country, under constant fighting with the natives, for nearly 300 years, and must have had a great many soldiers garrisoned there and others taking the place of those leaving or dying, I am rather inclined to connect it with the name of the Roman camp »Saalburg«. This is generally supposed to be derived from the Old High German *sal*, which is the English *hall*. But the word *sal* also tallies with the Old German or Keltic *hal*, an ancient term for salt mines or manufactories which is sometimes spelt *sal* — the town of Halle on the river Saale and many others. Very recent excavations at the Saalburg, moreover, have brought to light a memorial tablet to the mother

of the Emperor Septimius Severus, in which the surname of *Halicensis* seems to have been given to a Roman legion — the XIV<sup>th</sup> — that was for a long time quartered here, and later on even brought its name to Hungary to be left a mark on several localities there. — Thus, then, to an Englishman Saalburg would not mean Hallbury, but Salisbury.

## Explanation of the Synoptical Table.

In the composition of this table the principal object has been to group the ingredients in the most convenient way for the reader to understand their proportion in the various springs. As, however, the quantities of these ingredients are so widely different, some of them which are infinitesimal had to be magnified, in order to make them visible; thus the bicarbonate of iron had to be multiplied by 100, the bicarbonate of lime by 5; the chlorides and the carbonic acid gas, to show off better, were multiplied by 2.

Anyone desiring to know the exact figure of each compound as per one litre will find the same opposite the name of each source.

The figure for carbonic acid corresponds to so many litres of volume.

Regarding the weights given for each compound, I have first to state that the chlorides of all the Homburg springs are according to my own latest volumetric analysis, for which I assume the full responsibility. They are reduced to the value of sodium chloride. The figure of the chlorides in the Kissingen Rakoczy, likewise reduced to sodium chloride, was kindly furnished by Dr. Heckenlauer; it corresponds to the mean of January 1893. The bicarbonate of lime I have taken from the old analyses of Fresenius (1864—72) and for the Rakoczy from that of Liebig (1856).

For the exact weights of the bicarbonate of iron in all the Homburg springs I am indebted to Dr. Rüdiger's latest analyses that he kindly undertook for me.

Just as this pamphlet is going through the press, I am made aware that the dimensions of the table are not quite corresponding with the size of the pages. For this reason and, I trust, for the present edition alone, I have been obliged to strike off the analysis of the Ludwig, which happened to be at the top of the cast.



## The Way in which the Waters act on the System.

The three sources Ludwig, Elizabeth and Kaiser represent a class of mineral waters known as Natural Acidulated Brine Waters. Holding from  $8\frac{1}{4}$  to 12 per mil of the chlorides and a very large volume of carbonic anhydride, they range in the quantity of their compounds somewhat higher than the celebrated wells of Kissingen, while they contain more carbonic acid than any other known salt springs.

We have now, let us hope for ever, quitted those dark ages, when some mysterious power, independent of the natural action of water was supposed to preside over the Spas and give efficacy to their mineral springs. I therefore shall proceed methodically and shall dwell on the physiological effect of our waters as distinguished from others of the »eliminating« kind; but, as much of our knowledge on this point is still controversial, I shall only give what is indisputable.

The proximate effect of all saline and salt mineral waters is that on the stomach and the intestines. The question then, resolves

itself into one of absorption and its locality. Now, it is impossible to separate the action of the carbonic acid from that of the chlorides; Homburg waters without this pleasurable, sparkling, health-giving addition would sink into insignificance. We must, indeed, not lay too much stress on the solid matter contained in these waters and thus overlook the biological fact, that the presence of natural carbonic acid in any water quickens the receptiveness of the veins and absorbents in the stomach and intestines, increases the amount of water taken up by them from 7 to 14 per cent as compared with plain water, and very distinctly regulates the action of the heart in reducing the number of pulsations.

We next turn to the problem as to how the chloride or salt waters stand in relation to the sulphate ones, such as those of Carlsbad and Marienbad, in this question of their absorption by the mucous membranes of the stomach and intestines. They are both of a purgative kind and yet act so very differently on different individuals that they have often puzzled alike the patient and the physician. Many and varied experiments in this matter

have been rather vitiated by the fact that they were practised on animals under very abnormal conditions. This objection has now been met by a series of syphon pump experiments carried out on men by Professor Jaworsky at Cracow university. Thus specimens of the contents of the stomach were taken at varying periods from the persons who had taken the prescribed doses of Kissingen or Carlsbad water. The results were both interesting and important. The two kinds of waters were found to have quitted the stomach in about 20 minutes; but the disappearance of the principal salts of these two classes of waters proceeds at an opposite ratio to their temperatures. The Carlsbad sulphates leave the stomach the earlier, the hotter they are taken; the chloride waters such as Kissingen and Homburg remain longer than they do in their natural state when the water has become artificially heated. From this there is no appeal. It may be that a complete explanation cannot, as yet, be given, but the action of the carbonic acid as noticed above may in a measure help us to understand the discrepancy, its effect being entirely lost in the heated water.

Another fact brought to light by these experiments is this, that salt waters when sufficiently attenuated and cold, so far from losing their own chlorides in the stomach, are even able to solicit a secretion of them from its walls, before they themselves have left it and when some of their other components have already found their way straight into the blood.

This question of absorption has long been the bone of contention between physiologists. Are mineral waters taken up by the stomach or passed on into the intestines, and what becomes of them there? Distilled water, it is true, stomach as well as intestines are ready at any time to take up in large quantities and will send it on to lungs, kidneys and skin to be disposed of. It is not so with regard to saline and salt waters; their absorption fundamentally depends on what I may be allowed to call their osmotic equivalent, that is to say the specific quality to pass through animal membranes. Thus, the chlorides are well known for their high osmotic power, the sulphates on the contrary for their smaller diffusive qualities. Whilst, then, these latter

waters undoubtedly are hurried on in their entirety into the intestinal canal, after having stimulated the stomach by suddenly enlarging its surface, the cold acidulated brine waters are more likely to enter into chemical contact with the glands of the stomach. The result in both cases will be the removal of mucous accumulations. In their further downward course there is this remarkable distinction between the waters, that the sulphates are really and finally only taken up by the mucous membrane in a certain proportion (as measured by the amount found in the urine), a considerable part, in the case of the magnesium salts the whole, of them being transformed into insoluble carbonates and phosphates; of the chlorides we know this that nearly the whole of them is readily taken up and sooner or later passed out by way of the kidneys. For this particular process the general law that Liebig tried to lay down for all saline solutions still holds good for the chloride waters: The less concentrated these solutions are, the more easily absorption will take place. As a matter of fact, nearly all the mineral waters that are employed for drinking purposes will be found



to be very near the »standard« strength, i. e. the composition of blood plasma. Very likely the chloride waters are only slightly changed during their quick passage along the small intestine and await their final absorption into the system in that ample and quiet receptacle, the colon.

And here it is, in this very colon, that we have to look for the seat of the principal action both of the sulphate and the chloride mineral waters. From clinical as well as physiological evidence there can be no doubt that their line of attack lies along the course of the intestinal vasomotor nerves, the effect of which attack is to set up peristaltic motion, that function which is the pivot of so much of human happiness or grief. Exosmosis, or diffusion of watery fluid from the blood into the intestines, used for a long time to be credited with the main part of the purgative action of mineral waters. It has even been occasionally, though on theoretical grounds only, contended that by the course of drinking at watering places of the kind I am speaking of, a catarrhal condition was evoked in the mucous membrane, and this intestinal catarrh

was to be looked upon as the essential point. Happily for the frequenters of Homburg this view is incorrect, and for two reasons. First of all the behaviour of the intestines, under normal circumstances, is against it: we observe how these waters, as a rule, procure one or two alvine discharges which may be of ordinary consistency or semi-liquid, according as they hold the contents of the lower intestine only or have hurried along with them all that was still unduly remaining behind in an upper tract of the bowel. Secondly, a catarrhal state always suggests duration and the presence of pain. Practically speaking, if I ever saw very watery discharges go on after a lapse of several hours, or if I saw them accompanied with griping pain, I should look upon the water as an irritant and think it high time to propose a change. It is under these circumstances only, i. e. in cases of overdosing or excessive action owing to individual disposition, that we may perhaps expect to find some of the chlorides mixed with the stools. As far as my own observation goes, chemical tests applied under most varied aspects have never revealed to me more than traces of

those salts. On referring to medical literature I find, that I might have saved myself this trouble, since as early as 1853 and 1854 this question was looked into by well known German investigators and with the same result.

We shall now be able to estimate the mode in which the chloride of sodium waters operate on the system itself. It has been known for about 25 years, and hundreds of chemical experiments have proved beyond dispute, that the internal use of these waters is followed by the excretion in the urine of an increased quantity of urea, uric acid, phosphoric and sulphuric acid. Long series of investigations carried on for successive days have also settled the controversy, as to whether this surplus of waste compounds is merely washed out of the system or formed anew through such nutritive changes as are constantly going on in the plasma of the blood and the fluid of the tissues. The question has been decided in favor of the latter alternative. Evidence, moreover, of a direct kind has been brought to bear upon this point, since we have learned that the more appreciable quantity of these acids and salts is evoked

by the action of water alone and a part only by the chloride of sodium. The latter, however, creates the determining impulse in this way, that it solicits a larger and quicker flow of tissue fluids from the capillaries — which is another mode of prompting tissue change — and that even, in cases of a perverted or inverted direction of this flow, it may in a sometimes marvellously short space of time completely correct such faulty tendency. Evidence of a positive kind has not been wanting to prove this hydragogue action of chloride of sodium: a certain moderate dose of this latter salt, on being introduced into the stomach of man or animal, will immediately raise the specific gravity of the blood, i. e. its density. As this condition will last some time, an alternate action of flooding and draining can thus be produced. Similar effects on the system have been shown by myself with regard to bicarbonate of lime in a series of experiments on individuals in health and disease (Virchows archives, vol. 82).

The foregoing remarks will enable us to form a correct notion of a patient's state when going through a regular course of the Hom-

burg waters. By thus casting adrift clumsy routine and throwing overboard the heavy unscientific language of former hydrology we plainly clear our track. Our patient who, in the early morning, takes his two or three glasses of Elizabeth (as against 4 or more of the Kissingen waters) and perhaps a few ounces of some other waters in the afternoon, will in most instances at once notice an improvement in his appetite. This comes through a greater flow of saliva and a certain secretion of mucous from the gastric membranes; not, as has been supposed, by adding to the quantity of hydrochloric acid contained in the gastric juice. As the water passes down its way along the intestinal canal, it gradually removes the remnants of former digestion and opens out the epithelial cells of the mucous membrane and its glands. Sometimes the greater part of it is taken up too quickly into the system and passes out by way of the kidneys. This latter untoward occurrence, even if causing a little headache or giddiness at a time before the kidneys have been prompted to do their work, should startle no one. It may occur at any time during



the three for our weeks course and will then be followed by a plentiful secretion of urine of a lower specific gravity (down to 1007 and less). I have too often observed it to take it as a symptom of any meaning (i. e. with healthy kidneys) or to believe it to be due to a mysterious heightened receptiveness of the blood instead of a mere passing slowness of the intestinal muscles in responding to a given stimulus. More often it happens at the early part of the course, but occasionally also towards its close and may, at this latter period, suggest the desirability of bringing it to an end. Another visible symptom of flooding the system is the drawing of water into the bile, the disappearance of jaundice and at times the passage of gall stones. In a similar manner, when the water is taken warm, the kidneys are acted upon and pelvic concrements seen to become loosened and got rid of. The dialyzable qualities of the chloride of sodium waters of a certain percentage and their chemical relationship to tissue fluid, make them pass on to the more remote parts of the system and assist in the undermining of inflammatory and gouty deposits. A result

so satisfactory is not as a rule equalled by that obtained at other waters. Weight is not necessarily reduced by a well directed use of the Homburg waters; on the contrary, my note-book contains a goodly number of cases where people of a slight habit of body have increased by a couple of pounds. This fact together with our experience as to the enlarged formation of urea suggests a higher utilization of food as regards final tissue change.

The question of absorption of our mineral waters is intimately related to their temperature. Not every stomach has vasomotor nerves sufficiently controllable to allow assimilation to a glass or two of cold Elizabeth (temp. 50° F.) taken the first thing in the morning; and as there are many perfectly healthy individuals, so there is an certain number of invalids, to whom a higher grade of temperature becomes an imperative necessity. Among the latter I will name many of those affected with neurotic dyspepsia and some of the ordinary dyspeptics, many who suffer from weakened heart and anaemia or from modified, inherited and protracted gout. And such is the change wrought on men by years of ill

health, that cases are not unfrequently presenting themselves, where the cold draught has become intolerable, and the water must now be drunk warm. A good deal of the stimulating effect on the stomach, however, is owing to the presence in the water of so much carbonic acid gas, and this becomes evaporated and lost by warming the water. Of this I shall have occasion to speak when mentioning the baths and their mode of application.

About the Homburg iron waters very little need be said. Containing a large proportion of the chlorides their range of action is more extended than that of the pure chalybeates. It is their peculiarity that they agree with many a stomach which refuses to be dosed with waters like those of Schwalbach, Pyrmont and many others and that their use can be extended to some aged people with threatening degenerative changes, to whom the common chalybeate waters might be a caution. In its amount of bicarbonate of iron the Homburg Stahlbrunnen is inferior to none of the known chalybeate waters, a fact not generally realized even in Germany.

## The baths and their effect on the system.

The ordinary so called »mineral baths« consist of the overflow of the Ludwig- and Kaiserbrunnen and yield a highly sparkling solution of brine of about one and a quarter per cent. This strength will be found to represent the average amount contained in the most celebrated salt waters like Kissingen, Kreuznach, Wiesbaden etc. and is of much value for a variety of purposes. Nothing can surpass the sensation of tone imparted by such a bath when taken at the proper temperature. It is highly probable, that this effect is hardly owing to the large amount of iron held in solution by the water, while it is mainly due to the high percentage of the chlorides of sodium and calcium, as well as the large volume of free carbonic acid gas. Recent investigations in biology have shown, how a certain amount of saline matter is retained by the skin of the person bathing, and how, under ordinary circumstances, carbonic acid finds its way through the epidermis to the distal ends of the nerves. All this evidence

is of too serious a nature to be overlooked in the explanation of many facts connected with the action of these baths, and especially their tendency to bring about certain changes of the pulse and respiration, and to stimulate the nervous system. As the value of mineral baths is often questioned and even denied in England and elsewhere, my readers, I trust, will forgive my reminding them of these facts, among which I may quote as very conspicuous the altered and amplified form of the tracing of the radial artery in the sphygmograph as the proximate and ulterior result of such baths. A graduation of their temperatures enables us to produce the most varied effects on the general system; be they tonic, by lowering the temperature and thus stirring up the heat producing function of the entire system; or soothing, by raising the temperature and diluting with water etc. We can further make them absorbent or alterative at will, by adding the requisite amount of mother-lye or salt. This remarkable effect is witnessed in the reduction of scrofulous swellings of some standing.

It will be well for any Homburg visitor



to acquaint himself with the strength of our mineral baths in the undiluted state. Thus, taking for comparison's sake Vichy, we find at Homburg a double amount of solid contents, and yet we see at Vichy the custom still prevailing, of diluting the bath water by one half. I cannot but regard this practice as being the natural result of the heat of the Vichy Puits-carré and Grande Grille springs, which demands lowering by the addition of cold spring water; for otherwise no sane person would think of tampering with an already poor water, i. e. poor for bathing purposes. At Homburg the water comes up cold, and by its very temperature is more apt to retain its large amount of carbonic acid, and furthermore this is not lost by mixing with ordinary spring water, except in special cases, as formerly at the Old Bath House.

In the case of any acidulated mineral water everything ought to be done towards the preservation of its carbonic acid. Considerable attention has, indeed, been paid to this at Homburg. As early as 1856 a Homburg chemist conducted a series of experiments as to the best mode of heating the water, with

the smallest possible loss of carbonic acid gas. He tried the various methods employed in Germany and elsewhere: 1. by simply raising the temperature of the water, i. e. by heating it in a boiler — 2. by pouring boiling fresh water into cold mineral water, which took about 4 parts to bring up 12 to 86° F. — 3. by letting steam pass into the mineral water itself, and 4. by introducing steam into the intervening space of a double lined bath. The result of these experiments was this, that of the total volume of carbonic acid in the Kaiserbrunnen by the first method one sixth remained, by the second less than one fifth, and only by the fourth as much as one third. These figures demonstrate plainly the superiority of the method of heating as in No. 4, and I may add that in the Homburg Kaiser Wilhelm Baths this method has been adopted and a still greater saving of gas obtained by the steam passing only between the two bottomplates of each tub.

From all this it is easy to perceive that the most effective way of getting rid of the carbonic acid, whenever this may be required for drinking purposes, is that of simply heat-

ing, or rather overheating the water in a boiler. This process may be observed during the morning hours at the Elizabeth spring. It will at the same time be perfectly understood, that by this manipulation the principal agent for keeping certain chemical compounds in solution, is driven out. As a matter of fact, the soluble bicarbonates of lime and magnesia become altered into the less soluble simple carbonates; this is manifest from the deposit formed there and then. Moreover, with the escape of the carbonic acid the iron loses its hold on the water and turns into the totally insoluble oxide; the water assumes a troubled appearance and a certain quantity of granules of ochre are at once found at the bottom of the vessel. By placing the tumbler containing the mineral water in a bain-de-marie kept on the spot and slowly bringing it up to the required temperature a better result would be obtained — the potency of the spring would not be lost and the water itself would be more digestible.

In conclusion we must not omit mentioning the pine baths, a valuable institution of Hom-

burg, with their well known antirheumatic and antibronchitic effect. To this should be added their undisputed efficacy in neurasthenia, principally at the climacteric age, in scrofula, rickets, diabetes, chlorosis and hysteria.

Mudbaths are administered in three degrees of strength, according to the end desired. Their therapeutic action is tonic in all disorders of the nervous system, in many uterine derangements and in the rheumatic and gouty state. They may be said to represent the heightened effect of the mineral baths on the skin, pulse and nerves. Their physical qualities culminate in a diminished power of conducting heat, hence the higher temperatures at which they are used.

In future bathing at Homburg will gravitate towards the New Kaiser Wilhelm Baths where air, space and fittings make the bath rooms a not unpleasant place to spend three quarters of an hour in. It is to be hoped that henceforth the Old Baths at the Kursaal will only be for pine and other specialities. Very good pine baths are obtainable at the »Victoria baths«.

## Medicinal Effect of the Waters.

We will now take a rapid survey of the chief maladies that may be cured or alleviated by the waters of Homburg. For this purpose I beg to call the attention of the reader to the list of contents. He will then see at a glance, that I propose dealing with the subject, not so much by following the classification of scientific pathology, but rather by treating the various heads in the order of the frequency with which they present themselves.

First and foremost come those disorders that arise in the digestive organs. I have singled out DYSPEPSIA and given this mere symptom the name and place of a disease, because very often no more can be said of an obscure case, and it may be a wise plan to send it, for a mild course or for more thorough investigation, to a watering place like Homburg. I will illustrate this by quoting an instance. In a doubtful case of cirrhosis of the liver dyspepsia may be present from various causes; if the patient is improved by a course at Homburg, we may take it for



granted that either there is no cirrhosis, or it is only beginning, i. e. the condition of stomach and intestines depending on the same cause, alcoholism. If no improvement take place, then cirrhosis becomes a greater probability, i. e. dyspepsia secondary to and symptomatic of, the already existing condition of the liver.

Number Two of the list, GASTRIC CATTARRH AND ATONIA, explains itself. In such cases of gastric disturbance, by gently dissolving and removing from the mucous membrane of the stomach any superfluous quantity of mucus blocking up its cells, a twofold benefit is procured. 1. the pepsine contained in the glands is liberated and 2. free absorption is granted to the products of first or gastric digestion. There is no doubt as to absorption alone often being principally at fault in cases of dyspepsia and even dilatation. The normal function of the human stomach depends considerably on the continued removal, by the absorbents and veins, of the peptones formed out of the albuminoids, and the gly-cose and maltose as the result of fermentation

of carbohydrates as e. g. sugar and farinaceous food. If this removal be insufficient, we encounter first of all the effects of undue accumulation of vegetable acids, lactic, acetic and butyric, all of them producing heartburn or similar inconveniences; and later a gradual prolongation of the period of gastric digestion; as also that much dreaded symptom, dilatation. Taken in due time, this form of gastric disorder can be cut short, and real disease prevented. The action of Homburg water seems to be corrective as mentioned above, but it is also useful in quickening the process of stomach digestion. A good many observations carefully taken by me, at certain intervals after meals, in persons affected with this condition have proved to me a gradually shortening duration of that part of human digestion under the influence of Elizabeth water. Another frequent cause of chronic gastritis is anaemia which has been shown, by experiment, to diminish alike secretion of gastric juice and the motor power of the muscles of the organ, both of them helping in turn to prolong the stay in the stomach of its contents and thus creating a »vicious circle«. In all

these cases the balance between digestive power and its objects has been disturbed; and the Homburg Stahlbrunnen, either alone or in combination with the Elizabeth spring, often helps to bring on a fundamental change and final cure.

Many dyspeptics, at this end of the 19<sup>th</sup> century, come under the head of what we must call NEUROTIC DYSPEPSIA, though pathologists may disagree as to its essentiality. We will not take too hazy a view of these complicated disorders, but first of all single out those cases, where neurotic symptoms attend upon gastritis. Here, however, their name is legion and whole pages might be filled with the enumeration of the aches and pains, neuralgia and hemicrania, spasms and even fits, sleeplessness and partial failing of mental faculties, which all occasionally are the sole outcome of gastritis pure and simple. In such cases the usual eliminating and correcting course of Homburg waters is attended by great improvement in the sphere of nerves, and which thus may be allowed to take care of themselves.

On the other hand we meet with at least three distinct conditions in individuals more or less tainted with a neurotic constitution. Let me deal with them in their order of frequency.

First in the series stands the condition which I would call the »IRRITABLE STOMACH«. Though this complaint may be associated with ordinary gastritis, it can as a rule be easily distinguished from the latter. The state of neurotic hyperaesthesia (a mere synonymous term) is typical of functional sensitive nerve disorder and therefore vague in its manifestations, but all the same very harassing and sometimes exceedingly painful to the patient. It may lie dormant for a while and come to the front again on apparently small provocations. It does not regularly follow indiscretions at table, as genuine gastritis inexorably would; on the contrary, the patient sometimes marvels at its abeyance, when his very last nights proceedings were raising the ghost of its visit against him. Its more frequent form, however, is that of answering the call of some

apparently trifling cause. This varies greatly according to the individual disposition; ices or ice-cold drinks, sugar and sweets; fatty substances and some salads being among the most frequent. The very irregularity of these outbursts shows how little they depend on disturbances of nutritive functions. Nevertheless, as the condition here described is often accompanied by Atonia, it may extend to the intestines and become a more general and lasting trouble.

Regarding its treatment, I may say that, as neurotics generally don't bear drastics, so they do not get on under the effect of strong saline compounds or potent mineral waters. For those suffering of an irritable stomach, a carefully combined treatment of baths, drinking, electricity and manual operations has to be selected, also with due regard to the age and sex of the patient, his antecedents, the duration of his illness, the state of his muscular system and the particular order of nerves that may be at fault. In a word, in such cases the individual has to be looked to more than the complaint, and the best medical man would fail in his attempts



at curing, if here he listened to the precepts of routine and clung merely to time honoured usages.

Less often in neurotic patients the condition of either Atonia or Hyperaesthesia is found associated with a diminution of the peptic power of the stomach. Such a combination exists in young anaemic ladies. The routine iron treatment generally fails here, and the more stimulating course of Homburg Elizabeth and possibly Stahlbrunnen, both however in small doses, will answer more completely.

Still less frequently neurasthenia presents itself under two particular forms of gastric derangement known as HYPERACIDITY and HYPERSECRETION of the gastric juice. This new ground was first opened by German physicians and appears now to have found acceptance in most of the European schools of medicine. Whereas in mere neurotic Atonia we have either no permanent loss of function or only a decrease of peptic acidity, both apparently due to alterations in the life of true motor nerves, the two last mentioned

conditions must be looked upon as depending on *segnach* in the vaso-motor system of nerves. Diagnosis in such cases is difficult and requires the aid of chemical tests, in order to exclude from this debatable ground ordinary gastric catarrh and its consequences with the manifold acids formed in the diseased organ during the period of digestion. With regard to medical treatment, I have to mention these cases, as nothing is more apt to do them harm than mere routine practice. Of this the invariable use of alkalines furnishes the best example. Little may we expect by single doses of alkaline mixtures or doses to set up a barrier against hypersecretion or hyperacidity which continue to go on all the time, as the wants of such patients will probably never be met, not even by the largest permissible supply; nor is there much chance of restoring the damaged function by a course of alkaline waters. In prescribing for such cases the physician needs great tact and must proceed inch by inch. It may be that washing out the stomach has to be resorted to before the most appropriate drinking course can be determined upon and the

important question decided what kind of baths will be most likely to benefit the particular vaso-motor failing. As for electric treatment, whilst deprecating the use of the faradic current, I have seen unquestionable improvement wrought by galvanic currents of low force and mean tension.

Under the name of ENTEROPTOSIS a peculiar slackening of the intestinal folds and ligaments has latterly been described by French and German writers; an anomaly which may give rise to symptoms akin to those of neurotic dyspepsia. It is of rare occurrence, but should not be lost sight of, as forming a caution against the mineral water treatment.

For GASTRO-BILIARY CATARRH and GALL-STONES the routine has been for the practitioner to send his cases to alkaline waters, such as Carlsbad, Vichy and others. There is no disputing the fact, that by drinking great quantities of very warm water bile can be made to flow more readily and in greater attenuation, but the dogma of the specific

action of alkaline bodies on the secretion of bile, which so long reigned supreme in the minds of the professional and nonprofessional public, has now been overthrown, physiology having proved the very contrary to be the fact. I have myself seen cases much improved at Homburg and heard of others cured years afterwards; I have also known gallstones to be passed, often unexpectedly by visitors after the completion of their course. These facts alkaline fanatics may wish to explain by the 30 grains of bicarbonate of soda present in a litre of Elizabeth water; in the meantime I have no hesitation to give expression to my firm conviction, based on personal observation: that in most cases of biliary calculus and other obstructions occurring in the gall passages Homburg waters, judiciously administered, will be found as efficacious as the genuine alkaline or the alkaline Glauber springs.

INTESTINAL CATARRH, a Protean complaint, is in most cases much improved by a course of Homburg; the class of water, its dose and temperature varying according to the indi-

vidual condition. Diarrhoea requires close watching, but is generally amenable to treatment at the wells. In contra-distinction to this complaint which principally affects the mucous membrane, ABDOMINAL PLETHORA and HAEMORRHOIDS occupy the vascular system; they also contribute largely to the number of cases successfully treated, and at full doses too, by Elizabeth water. The exceptions to this rule will be duly considered in the chapter on obesity.

Passing on to CHRONIC ENLARGEMENT of the LIVER, we should always be guided by a strict history of the cases, before attempting to take them in hand. As a matter of course, whenever an enlargement of the liver follows and complicates the conditions of gastric and biliary catarrh or the state of venous plethora mentioned in the last paragraph, the ordinary »eliminating« course as practised at Homburg is to be recommended. There is another state of swelling of the liver, when this organ alone or principally becomes the seat and expression of abdominal plethora; a condition of affairs met with



in the tropics or still more so in individuals after their return from hot climates. It is a remarkable fact and has formed the subject of my own observation, that in persons returning from the East this disorder rarely developes before the end of the first year or rather the second winter. This rule tends to show how much this complaint must depend on a total change of all the habits of life and not on climate alone and thus accounts for the prompt action of our Elizabeth and in delicate persons of the Stahl.

Of late years another liver complaint has become better known and distinguished, it has been well described by French authors under the name of *angiocholite radiculaire*. This complaint being of a true organic and inflammatory character, but presenting many of the symptoms of mere functional disorder, must not be treated in the ordinary way followed at Homburg and other watering places, even when it should not present itself in the garb of a low kind of fever. I have been, for some time, a victim to it myself and also known and observed several other cases of it.

An explanation is perhaps due from me to all those who expect me to class and provide for, the disorder known under the name of »BILIOUSNESS«. No essential disease or condition exists of the liver that can be accused of causing these attacks. The liver, indeed, like any other organ of the human frame, may be the subject of congestion, but whenever true organic lesion is absent, these symptoms gathered under the popular and generic term of »biliousness« are referable more or less to mere functional and catarrhal derangement of certain parts of the intestinal tract. Thus a very passing and may be partial, blocking up of the common gall duct may give rise to momentary absorption of bile pigments into the blood and the wellknown frontal headache. Such biliary catarrh has already been mentioned as coming under the head of disorders amenable to treatment at Homburg. Again, we should never lose sight of the fact that the very physiological agencies within our own bodies during life are competent of themselves to bring about, if not disease, at least such disturbance in the scale of functions as will

distress the individual. In the case of the intestinal canal, any arrest or inversion of the order in which the manifold phases of digestion proceed, or any alterations of the receiving membrane or of its muscular apparatus, is apt to cause the taking up by the veins and absorbents of certain noxious substances, derivatives of albuminous food, as peptones, ptomaines, albumoses and alkaloids, that under normal circumstances either await further destruction in the liver or elimination in the ordinary channels. The subject is too wide for detail, but I may be allowed to say here that biological research has lately brought conclusive proof of what I have here advanced as a general proposition. I shall have briefly to return to this matter in the chapter on Diet. An auto-infection, or spontaneous poisoning, of this kind very often accounts for all the symptoms of a bilious attack and makes its victim in vain look for a palpable cause of it. The grand idea in France has of late years been to devise disinfection of the inner person for the cure of this complaint, and the list of disinfecting pills and globules has al-

ready reached a considerable length. I trust, however, my intelligent reader will understand why, instead of this clumsy method, I advocate for this susceptibility to spontaneous poisoning the more fundamental and radical treatment by mineral waters. Karlsbad and Marienbad may sometimes be indicated, but the more restorative and lasting effect should be looked for at Homburg.

CONSTIPATION as a habitual disorder being rather common among those frequenting our watering place, it appears desirable that I should devote to it a special paragraph.

Constipation may only be a symptom accompanying other affections, and will then take a place second in importance to them. On the other hand we do not fail to recognize a great number of cases, where such a habit of body occupies the whole foreground of an individual's life. Genuine constipation should be looked at in two different ways.

In the first place, then, we will suppose it to be caused by inadequacy of the mucous membranes or by unfitness of the contents of the bowels themselves to cause peristaltic

action. It may be, that gastritis is laying the foundation of such a state of affairs, or anaemia and chlorosis, or a scanty flow of bile, or an incorrect mode of feeding. All this apparently incoherent group of disorders comes appropriately under the domain of the mineral water treatment, though its special administration may very widely vary. Considering, however, the lapse of time taken up in the formation of such a habit and the arbitrariness of its nature, nobody will be surprised at my saying that the usual period of the Homburg course is far too short to secure a good result. Of our waters the Ludwigsbrunnen seems to act more promptly than the rest; it should, if possible, be taken cold and at full doses or alternately with Elizabeth. The simultaneous use of baths of a stimulating or alterative kind, or of douches and wet packs is much to be recommended. A proper diet is paramount.

The second large group of sufferers from habitual constipation will, I hope, be found to be less loosely strung together. The complaint here presents a more localised aspect, localised that is in the lower part of the in-



testines, the colon, and more often again in its lowest region, the rectum or the sigmoid flexure. The proximate causes of it may be found in malformation or much more often in faulty circulation and still more frequently in disorganised innervation, general or local. The mineral water treatment, alone and unaided, fails in cases of this description. It would be a bold undertaking indeed, to inundate such a person's interior with Homburg or Kissingen water, much less with Karlsbad or Marienbad, and expect this to make its appearance, all along those twenty five feet of intestinal canal, at the very little spot where muscular contraction is at fault. Victims of this erroneous mode of proceeding are to be met with at all watering places and are often heard to use strong language in describing their personal experiences.

It is in the management of this latter class of cases that **MASSAGE** has recently been legitimately adopted. Abdominal massage has, indeed, shared the fate of many other therapeutic agents and had to submit to being taken up as a fashionable thing and a whim

more than a well devised and strictly defined remedy. There has been a time when every other visitor to watering places had to go through the ordeal, and by unskilled hands too, a practice little calculated to promote its reputation among the general public. We will let bygones be bygones and try to lay down a few rules as to its mode of application in different aspects. All massage manipulations over the abdomen have either a purely mechanical effect in view or tend by causing reflex action to raise and improve failing muscular contraction of the intestines or the abdominal wall, but often these two effects are welded into one. Different manipulations are put into force for these different objects, their degree and the length of time of each sitting have to be attended to. The mechanical action, mostly of kneading, has great force in removing local obstructions and accelerating the flow of blood in people suffering of abdominal plethora and a state of hemorrhoids. It can aid the flow of bile and even expel gallstones. Muscular debility comes in for another set of manual applications, which should still be varied in cases of neur-

asthenia or hypochondriasis giving rise to the complaint. The mineral water treatment should certainly not be omitted, nor can we do without the additional help of stimulant baths and the faradic current. In all this, however, the greatest care and discrimination have to be used, and the patient should by no means be unceremoniously consigned to the mercies of an unskilled masseur. What is being practised under the name of massage at some of the hot springs has nothing to do with the particular kind described by me above, nor with true surgical massage — it hardly rises above »shampooing«.

OBESITY. For practical objects, let us distinguish between corpulence, i. e. that rich coating of fat seated principally in the integuments, and obesity, as meaning a blending of fat, short of degeneration, with most of the outer and inner organs of the system. The former may be inherited, or engrafted solely by mode of living, but is always inseparable from improper feeding and in people of advanced age results in bringing about the second variety, that of true obesity. Sundry

occasions have presented themselves in this treatise of speaking of obesity as complicating other disorders or diseases. Thus I must refer my readers to the chapters on »Gout«, »Anaemia« and »Diet«, where they will find the matter more fully discussed.

Essential or hereditary corpulence, principally in the young, should hardly come under mineral water treatment of any kind. Investigations in biology have of late years added a great deal to our knowledge of nutrition, and taught us how to avoid certain errors committed in former years on this score. The fat man described by Sir Francis Head, in his charming book entitled »Bubbles from the Wells at Nassau«, who unlike Diogenes did not live in the tub, but the tub in him, is now being reformed by a lifelong strict rule of living that implies a servitude, it is true, but nobler than the one of dining »en ville«, and less galling and degrading in the end. Concomitant symptoms, however, may occur, like dyspepsia and arbitrary constipation, or those of abdominal plethora, which would have to be cleared away, before the invalid is consigned to his subsequent and permanent

course of diet, exercise and gymnastics. In these complications a short preliminary treatment with the Homburg Elizabeth or the Marienbad Kreuzbrunnen may be advisable. The latter water or a course of Homburg salts which in chemical composition comes very near it, I have often to prescribe even here at Homburg; the former, however, has the advantage over the sulphate waters of not running down the spring too suddenly or reducing weight at the cost of some more precious material.

In no ailment has the physician to show so much forbearance as in the treatment of the state of obesity in the debilitated or aged. A scrutinizing inquiry has to settle those perplexing moot points of diagnosis, whether it be anaemia or heart affection that engender obesity or vice-versa; whether the existing perverse nutrition be functional or the first symptom of graver illness, and may be, of definite degeneration. The much varied aspect of this question does not warrant me in laying down more than a few rules of a general character. In the treatment of the obese we should not jump at removal of fat at any



price, but first look at the underlying condition and, if possible, get at this. We may have to face anaemia, gout, dyspepsia, constipation of an arbitrary kind, diabetes, before we can see our way clearly to go further, step by step. Then again, patients of this order are unable to bear either strong eliminating mineral water cures, or a too restrictive diet, or starvation of any kind, or even much sameness of dietetic rules. It is the arduous, but far from hopeless, task of the physician to initiate his client in a totally different mode of living, a thorough change of nearly all his previous habits and conditions of life. My readers will have to look to the chapter on »Diet« for some observations on »draining« that come in appropriately here. As for mineral waters, I will say that, barring genuine symptoms of degeneration, the Homburg iron waters are most efficacious in many cases of obesity. It may be requisite to reduce weight for a short period at the beginning of the treatment, in order to free the diaphragm and set up again the warped action of the heart and lungs. This attempt will be crowned with still greater success, whenever the omentum

is the principal seat of fatty deposits, and the peristaltic motion of the intestines as well as the free circulation in the abdominal veins has been thereby impaired. Often, indeed, the correctness of diagnosis with regard to these latter conditions, when occurring with obesity, is to be measured by the fast return of ease; or the quick descent of the diaphragm, as evidenced by percussion. In the administration of hot baths usually so efficacious in the treatment of the fat anaemic state we have to be guided by the constant use of the hemocytometer, as mentioned in the chapter on anaemia, since a diminution of red corpuscles involves a tendency of the blood, under a frequent repetition of baths, to increase the waste of albuminoids, which is not so much to be feared in ordinary anaemia or primary hydraemia.

RESTRICTION IN THE AMOUNT OF DRINK is not to be foregone in the treatment of obesity. The supposition with regard to this has been that. as the water or other fluids taken in have to pass through the arterial and venous net, a momentary or lasting effect on general animal hydrostatics is thereby created in the

human subject and oxydation lessened. Although this contention hitherto has not been made good in the normal and healthy subject, no doubt exists that with a diminished propelling and suction power of the heart, such an effect really must eventually follow. *Crescit indulgens sibi dirus hydrops. Hor.* Thus, in dealing with simple and uncomplicated cases of obesity (that of the heart not excluded), though no amount of drinking alone will produce an accumulation of fat throughout the system, it is remarkable how much any curative plan is supported by judicious abstinence in drinking. Speaking of the Homburg course, I can register more cases of obesity successfully treated with the help of partial abstinence in fluids within the last five years, than during nine years previous to the adoption of the modern plan. An explanation of this experience is to be found in the unmistakable draining of the subject. Diminished vascular repletion will give greater ease to the heart and other muscles in the performance of their functions in the corpulent. The patient gradually resumes a series of almost forgotten exercises, and consequently

oxidizes a greater proportion of carbo-hydrates, the supply of which, when restricted in the daily food, has to be furnished by stored up tissue fat. Thus a healthy circle of action and reaction is set up. It is easy to understand how much such a kind of abstaining has to be modified, according to the more or less aperient effect of the Homburg waters, and the way in which the kidneys act under their influence; for often, in persons with a sound heart, the result of drinking mineral waters and the consequent »flooding« will be the same as that of draining. At all events, cases of this kind should be as carefully watched as any one of graver pathological importance, particularly in individuals above fifty or of feeble muscular fibre or impoverished state of blood. I would, during the period of treatment of such cases, always insist on a frequent tally of the patients weight, and an occasional consultation of the sphygmograph. There seems to be no doubt, that the fat around the heart and in the pericardium does yield the first to any antifat mode of proceeding combined with baths; sooner even than the peritoneal fatty deposits. As a matter

of fact, I have several times witnessed, under similar circumstances and more especially in ladies, a shortening of the girdle circumference, together with an improved breathing power, before any remarkable loss of weight.

DIABETES. It may appear doubtful to most of my professional readers whether I am right in introducing the subject of Diabetes into my cursory observations on the Homburg water treatment, since this complaint is about to be banished even from the bills of Karlsbad. Genuine and frank diabetes of a highly developed form, let it be well understood, can not be promised a »cure« at watering places like Homburg. There is, however, another kind of diabetes of a much milder character, which manifests itself in the wake of gout, obesity and gastric and intestinal disorders and seems to be symptomatic of general nutritive changes — possibly pancreatic — such as have been described as coming fully under the domain of treatment by acidulated chloride of sodium waters. Not a few of these patients, some perhaps frequent visitors, during a course of four weeks or longer, perceive a marked



diminution and even disappearance of the one or two per cent of glycose in their urines.

THE GOUTY STATE. The essence of Gout consists in the appearance, in an insoluble state, of uric acid combinations in various parts of the system, but its manifestation by no means always depends on the quantity of uric acid present in the blood, which has long been the prevailing and fallacious idea. Owing to the quantities of the acid being infinitesimal, and other difficulties in the way of accurate judgement, the theory of this overcharging of uric acid in gouty blood is sometimes difficult to prove, and has not been, in my opinion, demonstrated clearly enough to have gained general acceptance. Furthermore, we do meet gouty attacks, in an unmitigated form, not only in the rich, the gross feeders, the consumers of beer and wine, but in the needy, the spare and the aged, who, with a perfectly wellbalanced daily budget of supply and demand, offer no opportunities, by excesses, for the deposition of Urea or Uric Acid. Frederick the Great, who was a shrewd observer, and had as a young man studied medicine in the

hospitals, used to say, when sixty years of age, »The Gout is fond of paying me a visit, because it remembers I am a Prince, and hopes to be sumptuously entertained, though I give it indifferent hospitality, and live plainly.« Again, (if I may bring in some circumstantial evidence), the urine of gouty people, instead of containing excess of uric acid, holds less of it than the average, except in some advanced and chronic cases. This fact, so frequently verified during the long course of my own investigations, would be apparently very easily explained by those who hold the retention theory, (that is, retention of uric acid in the system, by a failing on the part of the kidneys,) but two cogent facts invalidate this presumption. First. The condition of the kidneys, although sometimes impaired at a later stage, has never been proved to be one of morbidity at the very early period, of well-marked and violent attacks, in vigorous people, and when larger quantities would seem to be at work. Secondly, with people who excrete small amounts of uric acid, the accumulation must always cause very formidable results after a lapse of some years, whereas, we

often see these hale and hearty, having only slight attacks or none at all, provided their system of living be well balanced.

This line of argument must induce us to regard gout (especially when taken in connection with hereditary disposition and alliance to such complaints as lead-poisoning, and other diseases of the blood,) as a deep-seated disturbance of nutrition, which has the tendency to allow uric acid, even when present in small quantities, to separate and become precipitated in the more insoluble form of sodium-urate in the system or of crystalline acid in the kidneys and bladder. For I am not ready to disassociate the state of gravel from that of gout, they certainly both occur too often alternately in the same individual, or among members of the same family, to be regarded as merely coincident. In Germany gout, a frequent complaint of former years, has greatly given way to gravel; in England true gout is the rule; but both are likely to dwindle down to greater insignificance yet.

I had to dwell on these points in order to make it clear, why, in the treatment of gout I do not go in for a blind »elimination«

course. Strong alkaline doses are often known to develope an acute attack; nor is energetic treatment with hot baths and douches\* a very safe remedy. Weak alkaline waters taken internally offer little hope of lasting improvement\*\*\*; the hot ones among them, if they help to expel gravel, have this power in common with all other hot mineral waters, whatever their chemical constitution may be. Their action is precisely that of hot water itself, which indeed fifty years ago played a certain part in the treatment of gout, but has now become utterly obsolete. No one of the devotees at Contrexéville is bold enough to stretch physiology

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\* Certainly, the power of raising the excretion of uric acid, which has been claimed for certain hot mineral springs, is true; but any Turkish or hot mineral bath has the same effect, producing at the same time an increase in the quantity of sulphuric and phosphoric acid which sometimes continues for a couple of days. A satisfactory number of analyses, principally carried out in Germany, attests this fact, proving what a wonderful stimulus hot baths give to metabolic changes in the system and consequent formation of uric acid in the blood. Thus the «elimination» idea has become hopelessly stranded, as far as the blood goes.

\*\* If there were any eliminating power in them, there would have been great rejoicing, and favourable analyses would have been published, but hitherto this treatment has failed. Confirmatory of this some unedited experiments of a friend and some of my own, show that alkaline waters, drunk in the ordinary quantity of from one to two pints, have rather a tendency to diminish the daily amount of uric acid excreted than otherwise.

to the extent of affirming that the principal ingredient of its waters, («sulphate of lime», the most insoluble material found in any waters,) is there digested and taken up by the system. Among alkaline waters I must except those containing sulphate of soda, like Carlsbad, which are capable of bringing about some alteration.

For after all, this change of nutrition, is what appears to be thoroughly needed by the gouty, and the chloride of sodium acidulated waters seem to be more capable of stirring up vasomotor nerves, of entering into the tissue fluids, and altering the whole cell life of the human frame than other waters.

In the young and plethoric, reduction of weight and superfluous fatty substance will promote a better circulation and diminish the chances of uric acid accumulating in some isolated part of the system. My previous remarks as to the mere quantity of the acid not being a distinct test of the gouty state must not be construed into an admission that we may neglect it in individuals tainted with strong hereditary disposition, or already the victims of the disease. If an individual have this



hereditary or acquired tendency to precipitate in his blood crystalline sodium urate, his chances of adding to the deposits will grow with his larger bulk, and with his greater consumption of nitrogenous matter, and it is by the use of our Homburg mineral waters that we reduce this weight and provide against the superabundance of uric acid, while by diet we assist the treatment and hope to control metabolism for the future.

In the older subjects, or those suffering from irregular gout, faulty digestion is often the most prominent symptom, and occasionally itself perhaps no mean instrument in causing the nutritional changes which underlie the gouty state. Some patients of this class have kept in abeyance gouty seizures and other unpleasant symptoms, by habitual yearly visits to Homburg. These go in for mild treatment, moderate amount of drinking, no very exaggerated bathing or douching, and for a 3 or 4 weeks treatment only; while in the former class even one or two visits have been enough to bring about an amelioration. So that we have no right to talk about »elimination,« here.

In the matter of chronic gouty joint deposits and tophi, it will be easily understood from the foregoing observations, that little is to be expected towards their absorption by any therapeutical interference at all; furthermore we owe to the classical researches of Sir William Roberts on the chemistry of gout, (*Croonian Lectures. 1892.*) the discovery, that on the crystalline sodium urate neither blood serum nor the ordinary 1 per thousand solutions of soda, be they of the chlorides or the carbonates, have any dissolving action worth mentioning\*. The cases on record, in which chronic gouty joints, have been reduced by therapeutical treatment, have been when the patients were suffering from rheumatic arthritis,

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\* Potassium salts would appear to stand a little better in this regard, but no better than plain distilled water. Any one who wishes to give them a trial in »eliminating,« ought to remember two points. Firstly, that alkalizing means, to saturate not the blood alone, (for this has very little to do with gouty deposits,) but the great mass of the rest of the fluids which, at the rate of one per thousand, would require dosing the patient with as much as one tenth of a pound of the salt, for the 100 pounds of fluid held by the average weight adult man. Secondly, this rate being subject to immediate change by the continued draining off through the kidneys, the dose would have to be constantly repeated. If among medical men any enthusiastic »Eliminator« be found up to this gigantic task, it is to be supposed his client at least would soon rebel.

or when there was a disappearance of secondary and inflammatory swelling around gouty crystalline deposits of smaller size.

The acute gouty seizure must at all times be clinically and empirically treated, and I have no objection to raise against an attempt at moderate eliminating, under the circumstances, provided nature herself fail to do it.

Finally, in Gravel and Calculous Deposits in the kidneys we have the uric acid diathesis showing itself in the secretion of crystalline uric acid in substance, varying in its degree according to density and acidity of the urine, and to the smaller or larger proportion in it of some saline ingredients.

At Homburg, as at other watering places, we are in the habit of seeing very respectable quantities of the red crystalline, cayenne-pepper like sediment forming, sometimes to our surprise even in patients in whom we did not suspect its presence. As a means of promoting this desirable phenomenon, mineral water should be drunk plentifully, and diluted; and I have found alkaline waters also useful in obstinate cases, if taken during the day and before going to bed.

The action of mineral waters in these cases is more easily understood, as their way from the intestines to the kidneys is the shorter one, going as it does through the blood only and not through the endless tissue fluids. As was to be expected, the appearance of these red crystalline sediments has been much welcomed by those who believe in the »eliminating« method; they not only contend that it proves a washing of the blood, but even a ferreting out of urate deposits from their hiding-places. Chemistry refuses to be associated with such untenable theories. Uric acid can only be dissociated from its bases in the presence of acids, and must of necessity await its formation till the kidneys are reached.

In conclusion I would say one word as to the practice to be observed in dealing with uric acid diathesis cases; attention is to be given principally to the urine, the amount in 24 hours, its density and acidity, the exact weight of the uric acid, its degree of precipitability, and the period when the first crystals begin to form spontaneously. The various methods of determining these characteristic symptoms I cannot detail here, with

any profit to my readers, but I would point out the great importance of microscopical examination of the form and size of the crystals, the former sometimes allowing a guess as to their origin, the latter giving perhaps confirmation or denial to our diagnosis of a gouty kidney. In this latter respect, and chiefly in obscure cases, or at very early stages of the complaint, the microscope serves as a detective on this and many other points. During a course of waters all these issues summarized have repeatedly to be investigated, the appearance of the uric acid has to be carefully controlled, and the secreting power of the kidneys to be well watched. It will be understood here that any cursory examination of the usual little specimens brought by the patients is of no use whatever. Diet ought to be strictly watched, and as nearly as possible accommodated to a perfect balance of nitrogenous metabolism.

ANAEMIA IN ITS VARIED ASPECTS. Perhaps I have to ask my readers forgiveness for introducing a subject so common as the treat-



ment of anaemia by chalybeate waters. Doubtful as I am of much of the action of iron when administered as a drug, I nevertheless wish to mention the Homburg steel waters; not merely for the sake of completeness, but with the hope of pointing out their definite value. The way in which iron becomes incorporated is still baffling physiologists. Pathologists of the clinical order and most medical practitioners generally believe they have records of well attested facts of absorption having taken place. I do not dispute them, but merely state as my opinion that, in order to make action possible, we have to clear the way for it. The two great depots for food, speaking of it in the chemical sense and including iron, are the countless myriads of white and red blood corpuscles that crowd our vessels and absorbents; and just as no amount of nutritious food will be taken up by white blood corpuscles, before we have made them ready for it, so our red corpuscles will refuse admittance to iron in any shape, unless it be at a time when the system has been placed in a condition of fitness for receiving it. This is the whole

secret, why chalybeate waters so often fail when taken at home. They require the help of metamorphoses like those brought about by the working of new surroundings, climate, scenery, fare and baths, to find the system »primed« for their use. All watering places as a rule, possess such conditions, and Homburg very prominently so, on account of the dryness of its air, the pleasantness of its neighbourhood and the excellent quality of its mineral baths. A prominent advantage of the Homburg iron waters consists in their being of the muriatic-chalybeate kind, i. e. partaking in a great measure of the digestive qualities of the salt springs and thus rendering their iron more soluble. Unless this were so, we should fail to explain the improvement taking place under the action of Homburg steel springs, in some complaints that as a rule are not amenable to the iron treatment at pure chalybeate waters like Schwalbach, Pyrmont and Spa.

Essential chlorosis in young women during the period of development and soon after the age of puberty may be sent either to the pure chalybeate waters or to the muriatic-chalybeate. Of the latter class Homburg may

be said to be the first representative. The former class, however, often seems to be the more apt to produce the desired effect, i. e. provided the constipation which so commonly follows their use, be not an obstacle.

One important qualification of all iron mineral water treatment ought to be well understood, which is, that no course however carefully laid down is likely to benefit, unless for weeks previously all dosing at home with similar drugs has been stopped.

Quite a series of conditions presents itself, where anaemia is associated with other morbid causes, and will not yield, unless looked to in common with those. Most of them are faults of nutrition, essential shortcomings in the working of the human economy. I must mention that peculiar kind of obesity in sallow, puffy individuals of middle age, with a family history of gout and sudden breakdowns of heartpower, themselves of weak muscular fibre, prone to palpitations, disordered and varied conditions of urine, etc. Such patients from the borderland of degeneration may often be reclaimed by change of living, change of climate and the judicious administering of the

muriatic-chalybeate waters; always in combination with tonic baths. I am not afraid of including some cases of the mingled characters of true gout and vascular change with a touchy heart. Much as we would shrink from ordering these patients to drink pure chalybeate waters — which might be called putting new wine into old skins — we are warranted by long experience in proposing to them the treatment of either the stronger Homburg steel waters, or the Elizabeth in such small doses, as shall secure, in the last mentioned water, the proper effect of its smaller amount of iron. What we are to avoid is the overdosing with carbonic acid; what we should always contend for, is the unconditional surrender to medical rule and superintendence.

It is needless to say, that climate and these waters combine to bring on deep salutary changes in tropical anaemia, with the exception, however, of manifest or disguised malaria, that is with an enlarged spleen, I must confess that even in the tropics true anaemia I have seen rarely in men. In these latitudes the tests as mentioned below have hardly ever revealed to me, in persons who

have had a long career in India, more than just a slight falling short of colouring matter.

But to define more accurately my position and that I may not be accused of publishing rose-coloured reports, I wish to say that in cases of anaemia improvement to me means the heightened test for haemoglobine as taken by Dr. Gowers' instrument and an addition to the numbers of red blood corpuscles when found defective. It is only by determining these two factors that we can hope to arrive at forming a just estimate of the patient's condition before, during and after the prescribed treatment.

NERVOUS SYSTEM. Some of the disorders of the nervous system fall within the domain of the treatment at Homburg. For paralysis bathing in mineral waters of the »thermal« description is as old as medical science; but latterly there has sprung up in Germany the practice of sending the paralyzed more frequently to the springs containing a combination of salt and carbonic acid; and the more of the latter, the better. Such are Nauheim and Rehme, and pure carbonic acid baths at Mein-



berg. The results have been good, as far as many of the accompanying symptoms go, such as trembling, pains, general debility; and in a fair number of cases paralysis itself has much improved. We are holding out the same treatment to these invalids at Homburg, and with much the same result. Should patients from England wish to try it here, they had better write beforehand and send in a statement by their medical advisers. For them it may be sometimes advisable to choose the Rhine route, by boat from Rotterdam to Mayence, and even to Frankfort.

Cases of neurasthenia find their way often to Homburg. Among them that class most readily recovers, whose nerve power has broken down through the enormous strain modern life and mental work place upon it. All of them require the tonic treatment, but it would be a grave error to submit every case of neurotic dyspepsia to a routine course of Elizabeth water and the regulation diet. Still, the very complex nature of this modern complaint does not adjust itself to a general plan of therapeutics; and we shall always do well to bear in mind the remark of the well known

American writers on the subject, viz: that the neurotic element is very often found represented in muscular and ruddy individuals. Of locomotor ataxia I have been able to register several cases notably improved at Homburg. Their treatment does not exclusively depend on the use of the waters; active aid should be given also by massage and gymnastics.

At this stage of my observations I have now to name that very serious ailment formerly called rheumatic gout, later on »Arthritis Deformans« and latterly »Neurotic Dystrophy«. Dr. Wm. Ord in an address before the British Medical Association some years ago, has succeeded, and I think satisfactorily for many cases, in linking its manifestations to other complaints of a tropho-neurotic character. In trying to distinguish it from chronic rheum-arthritis, the accuracy of our diagnosis will be avouched, if we look for the characters of symmetry, progressiveness and simultaneous occurrence of these lesions in muscles and nerves. Doubtful cases and affections of single joints I treat as chronic rheum-arthritis pure and simple; as I also, in practically dealing with them, proceed on a surgical plan

of treatment, whenever the general state of health warrants such manual means as extension, stretching, kneading, working etc. The general state of health is the great point not to be lost sight of, and everything should be done, by way of bath treatment, to allay the excessive irritability of the nervous system and the conducting nerves. The greater deformity, the larger number of joints attacked, the more serious or extensive wasting of muscles, particularly if preceding as to time the articular neuroses — all these conditions, singly or together, interfere with a favourable prognosis of ultimate recovery, but, so long as the patient can travel and can be got into the bath, they do not form an actual prohibition to his coming away from home. This should be for a long term only, i. e. including from two to three months of the mild season, and under constant supervision. As to baths, the milder ones are to be recommended and will be found to allay pain, subdue refractory muscles and gradually reduce articular swellings. The effect of the dry and warm Homburg climate is no mean agent in bringing about this change in the trophic nerves.

Any attempt at dealing with this arbitrary complaint is, however, more likely to prove abortive, unless it be supported by the simultaneous internal use of some natural aërated alkaline mineral water, lithia for choice. The qualifications applied by me to the unconditional and indiscriminating exhibition of alkaline remedies in the gouty state are not valid in cases of chronic nodose joint affections, be they purely rheumatic or of a tropho-neurotic nature. I refrain from entering into a discussion of this fact and therefore simply record it as resulting from my own practical experience.

The treatment of neurotic dystrophies as depending on morbid states of the uterus will be mentioned under »Uterine Disturbances«.

DISEASES OF THE HEART. To some English readers it will sound strange to hear of heart complaints spoken of in connection with mineral waters. I am nevertheless bound to maintain that in some of those disorders the bath treatment ranks first and foremost, while in others the drinking of certain waters will afford great relief.

ACUTE ARTICULAR AND MUSCULAR RHEUMATISM. more or less associated with feverishness, is known to be the most frequent cause of » Valvular disease« of the heart. Considered as an established morbid condition, it would in some cases and in due time become, as pathology calls it, compensated and, for some years at least, allow the patient a moderate enjoyment of life. But unfortunately he continues to be exposed to two very great risks, the one being that of relapses and therewith grave complication of his former state; the other that unknown quantity, the result of innumerable combining factors: doubtful compensation. Thus the period of convalescence and that immediately following it is particularly fraught with danger and causes us to look round for better remedies than rest and good feeding. Thirty years ago nothing would have been more removed from the medical mind than that it should be proposed to the patient to take a course of baths to steel him in his further fight for existence. Clinical experience, however, has since taught us, how in the brine baths, and perhaps much more so in the acidulated ones, we possess a remedy



of marvellous efficacy under such circumstances. Year after year patients of this class come to spend from six to eight weeks at the wells of Nauheim Homburg or Kissingen and their history is conspicuously placed on record. Some, principally the younger ones and after first attacks, may go away perfectly and permanently cured; others gain relief of their more distressing symptoms, and such as no other medical treatment can hold out to them.

When looking round for an explanation of such changes, we must not let one important point escape our notice, *i. e.* the fundamental action of brine baths on all inflammatory and rheumatic deposits. Valvular trouble always means such defects of the heart's valves as are caused by the thickening and hardening remaining after rheumatic inflammation at the particular point where, even during the hours of sleep, the organ is least at rest. These traces and deposits may be recent and friable and then are more easily reduced by any such potent anti-rheumatic agency as the acidulated brine baths; or they are old and cicatricial, and in this form will yield less easily.

Another point not less important and bearing directly on the heart's action is the alteration brought about in its contractions. The immediate effect of a brine bath is a decrease, at some time of the day and for a number of hours, of the quickness of pulsations. Gradually, as the course of treatment goes on, this reduction becomes permanent and also the tracing under the sphygmograph manifests the characters of greater regularity, more decided ventricular upstroke and a smoothing down of some of the tottering secondary waves and indentations. At the same time, with slowly receding lines of the diagram of the heart as mapped out over the chest and as a further proof of returning contractile power, certain signs of malcompensation begin to disappear, as shortness of breath, lividity and instability of colour and many little disturbances of digestion. Sometimes, even oedematous swelling of the feet had begun to form, and this is then among the first symptoms to go.

A third element assisting in a more general way is that of the internal effect of the waters to remove obstacles to the passage of the blood in the great organs of the abdomen and

thus afford a much greater freedom to the heart itself.

Thus far the track to be pursued in heart maladies is sketched out with no great difficulty. The more serious question arises with regard to the large class of chronic and complicated heart cases, whether the generally accepted opinion, that they as a rule constitute a *Noli me tangere*, is to be respected any longer. As I am firmly convinced, that to some of them the advantages of the mineral water and bath treatment should not be lost, I must clear myself in the eyes of possible opponents and for a moment look at the matter from a closer point of view. Our estimate of what are to be considered suitable cases lies mainly in a correct diagnosis and a careful distinction. In the chapter on Obesity I have mentioned certain conditions of the heart that are eligible for a treatment as practised at Homburg, some hints at the same subject will be found under »Diet«. The fatty heart, if occurring without dilatation and in persons not old, offers no objection to a moderate bath course. Valvular disease, even with frank regurgitation, so long as it is fairly well com-

pensated, finds at Homburg, during a course of drinking, so much improvement of gastric and other troubles dependent upon it, that the patient sometimes forgets the underlying evil, or never becomes aware of it. Of these my note book includes many a septuagenarian that year after year makes Homburg his Mecca. A careful use of baths, chiefly in persons of middle age, has been observed to reduce hypertrophy to a degree more compatible with a feeling of comfort and still not damaging compensation.

The action of mud baths, in the conditions described, is similar to that of the brine baths, but has to be still more closely watched.

In considering heart complaints in connection with the Gouty State and with Artérial and Capillary changes we are entering upon more debatable ground. The young and vigorous gouty patient, if not affected by valvular failing, will bear a good deal of energetic treatment and at its close will be relieved sometimes permanently of some apparently grave heart symptoms. Aged gouty patients and all those showing symptoms of vascular thickening or atheromatous degener-

ation have neither kidneys good enough for the amount of work imposed upon them here, nor can we be sure of the degree of reaction their skin and capillaries will develop on the stimulus of a bath. As arterial atheroma is malignant, so fibrosis is progressive, and both are »aliens«.

The admission of chronic Dilatation will rarely come under discussion, its very nature mostly implying general loss of muscular energy and more especially such structural weakness of the heart, as would make any active interference a risky undertaking. Doubtless, in the case of dilatation being caused or aggravated by obstacles in the distal ends of the arteries a hot bath may for a time unbend the arterioles and diminish vascular tension to the profit of the heart, but the ultimate effect of such a remedy, when repeated, would be that of an irritant, contrary to the rule above laid down as to salt baths in commencing rheumatic valvular trouble.

A successful treatment of all cases of heart disease will solely depend upon the choice of waters and the adaptation of the bath treatment to the requirements of the individual



circumstances. Temperatures will have to be greatly varied, but the cooler baths offer a better chance of a good result.

UTERINE DISTURBANCES. There are some uterine disturbances with or without engorgement, purely depending on the general state of abdominal plethora described above. Now and then they are erroneously looked upon as the expression of local disease and consequently much worried by treatment with local remedies. The sensation of weight and pain, the leucorrhea and irritability, the various menstrual disorders, flooding included, and all the concomitant symptoms of neighbouring organs, such as the bladder, make the burden of life almost unbearable to these invalids. A proper bath and drinking course will then be attended with results of returning ease and a feeling of comfort after years of suffering.

In genuine metritis, the symptomatic state described may be caused by or may itself be the cause of, displacements and secondary inflammations of the ligaments, ovaries and the surrounding tissues, or the uterus may, from former pregnancies, have continued in a

state of sub-involution. Both are favorable objects for a bath course, even when other treatment has failed.

Excepting cases of shrinking with much symptomatic neuralgia, I consider all patients with metritic and parametritic engorgements and the remains of cellulitis, eligible for our ordinary and more particularly the mud bath course, and believe, from my own experience, the latter two classes to have the best chances of profiting thereby.

The mode of treatment is at Homburg exactly the same as at other places, like Kreuznach, which has for a long time been considered almost a panacea for this kind of complaint. Possessing the same water, but with the more pleasant addition of carbonic acid, the Homburg wells are employed for baths more or less prolonged, hip baths, wet packs and injections, as the case may require. An important feature in the Homburg treatment is to be found in the auxiliary use, for internal purposes, of the powerfully eliminating Elizabeth source, or the tonic Stahlbrunnen. Often the combined effect of the two is desirable, at other times they are employed in

succession. In very protracted cases and those with shrinking of the pelvic cellular tissue and consequent neuralgic symptoms or those leading on to articular dystrophies the mud baths are of great use.

Such uterine derangements as are manifestations of fibroid tumours, including the more alarming one of hemorrhage, gradually find their way to Homburg more often now than formerly. As a matter of course, we have no means at our disposal here of radically curing the morbid growths on which they depend, though considerable diminution of size is observed after one or two courses in more than a quarter of all cases. The effect of our baths, however, is to reduce all that pernicious swelling of surrounding tissues and mucous membranes which, more than the tumour itself, is the source of discomfort, pain and sometimes graver trouble, such as hemorrhage. For the latter inconvenience, when occurring in a fibroid that has invaded the larger part of the uterine substance, the simultaneous application of the faradic current is needed. In reviewing the latest statistical reports of that most modern of all methods,

the electrolysis as practised by Apostoli I fail to recognize its preference excepting for very large tumours and those of rapid growth, or during a season when bathing is impracticable. It requires quite as much time and patience as the latter proceeding.

SCROFULA. No sceptic in matters therapeutical will question the justice of the claims of salt springs and their baths as to their being capable of subduing or radically curing the scrophulous diathesis. All brine baths have this in common; but they mostly require the further assistance of good bracing air and favourable surroundings. Scrofulous children are directed as much to inland places as to the sea; swellings around articular surfaces and bones, or those of glands, do well in either of them, and it is a matter of mere convenience or expense, whether to send them to the one or to the other. In scrofulous eczema, nevertheless, places like Kreuznach, Reichenhall, Kissingen, Homburg and innumerable others, some of them also in England, have a decided preference over sea bathing, as practical experience in Germany has now

established beyond doubt. What we can offer them in Homburg, are the mineral water baths of about one per cent chloride of sodium and calcium, to be strengthened, if required, by the addition of mother lye or the usual compound bath salts. Patients of this class cannot expect to be cured in a few weeks, or by a given number of baths, but must make up their minds to come for the better part of a season, be that spring, summer or autumn. They should live as near the bath-houses as can be done. Treatment is by drinking, bathing, packing and inhaling combined.

## Diet.

Food. The all engrossing topic of »food with mineral waters« calls for a large share of our consideration. Anyone who has read the literature of the last two centuries referring to the subject must marvel at the amount of loose and disconnected advice on this chapter of dietetics. Each succeeding era of science, each new discovery in medicine has left a mark, and prescriptions have been thus handed down to posterity side by



side with totally opposite rules and regulations. It became the fashion for each practitioner to frame his own dietary and, if possible, add a new dish to the list of those already proscribed. This index of forbidden cookery in time was made the object of worship for visitors and innkeepers; the former blindly believing and trying to make others believe it; the latter profiting largely by setting before their customers the stale food declared to be regulation diet, and charging for it as any *maître-d'hôtel* would on the Boulevard des Italiens. These days are not altogether gone by; and certainly in the heads of the majority of the non-professional public some wild notions still exist as to the mischievous consequences of two or three glasses of mineral water meeting, on the common ground of a man's inside, some article of food mentioned in some of these arbitrary lists. To theories like these I must give an unqualified and unflinching denial; unqualified, because science has nothing to do with them; unflinching, because some courage is required to utter unfashionable truths. Instead of editing a general dietary

for the convenient use of all comers, I take upon myself the more difficult task of retracing, guided by the information the patient himself is able to give, the long road which brought on ill health; and if the Homburg »water cure« should appear to me to be desirable, then I am sure of finding a mode of diet for his particular case and the special treatment that he may require.

Having thus set down, in broad lines, the principles that should guide us in our dietetic prescriptions for patients at the wells, I readily submit to entering into a short discussion of a few items that may be said to claim an importance beyond that of a mere theoretical controversy.

The much ventilated question as to sugar has been declared to possess importance in the treatment of gout. To suppose that sugar, when coming in contact with any quantity of Elizabeth water, several hours after it has been taken into the system, would exercise a particular, much less a detrimental, effect on the individual, would be to say, in the face of all sound physiology, that these substances in passing through the human

subject continue to retain their original shape and composition.

Next in importance follows another article of the breakfast table, bread. This should be stale or toasted, sometimes rusks or biscuits should take its place; and in cases of arbitrary constipation, one slice of whole-meal may be allowed with the rest.

A regular war has been, and is being waged, against the use of butter. Apart from the caution to be observed in this respect by most of the dyspeptics, I do not join in the chorus of general condemnation, but forbid much butter at breakfast, from a wish not to counteract the very physical and chemical effect of the waters on the stomach, by such an inconvenient thing as clogging its cells and absorbents. In chronic constipation of the bowels the use of butter can not be wholly dispensed with.

In trying to set at rest another troublesome point, viz. that of fruit and raw vegetables, we must draw the line carefully. Whilst fully admitting that strawberries, peaches, melons and pears, if very ripe, need not be avoided by most visitors to the Hom-

burg Saline waters, some dyspeptic people should not eat them even in the cooked state. Any course of the steel waters is incompatible with the patients' partaking of either salad or raw fruit at any time of the day, and for at least ten days after the completion of the cure.

Soup. Considering the ancient recommendation of this article of diet, which was to be found on the tables of the Egyptians, not to mention Greeks and Romans, it would be rash to exclude it from the daily bill of fare, as many are doing nowadays, looking upon it as a mere conventionality. In matters medical the public mind is particularly fickle and prone to bid for easy and sensational conclusions, and at no time should the medical man be more careful in stating his own explanation of pathological facts, than when he finds himself in agreement with some widely spread popular theory. When there is no urgent reason to insist, for a time, on an exclusively dry diet, I believe even our dyspeptic patients may profit by such peptonizing properties of beef tea and broth as physiology has by experiment found to exist in

them; with the proviso however, that there should always be the necessary interval of  $\frac{1}{2}$  to  $\frac{3}{4}$  of an hour, between the soup and the remainder of the meal.

DRINK. Diminished introduction of fluids has of late formed a prominent part in therapeutics, principally with the object of producing decreased lateral pressure in the arteries, and thereby influencing such cases of heart disease as were supposed to be connected with heightened vascular tension. But more frequently such a mode of treatment has been recommended in cases of obesity.

Whenever the question is asked, how far we may allow a *dyspeptic* patient to indulge in the use of drink of any kind during his course at Homburg, the answer must be varied according to the merits of the case. As a general rule, during a period of thirty five years, I have seen so much benefit derived in the majority of cases of dyspepsia, gastric catarrh, dilatation or mere atonia of stomach, from the so-called »dry« treatment, that this dietetic method seems to me to be applicable also under the circumstances pre-



vailing at Homburg. This treatment was first suggested in Germany by a simple but clever peasant, but it was long before it became accepted by the regular practitioner. It consists in carefully limiting the amount of fluids taken at meals, soup included. No curative course of mineral waters is alone sufficiently potent to reduce such functional disorders of the stomach, as are included under the above nomenclature. After having previously freed that organ of any food remaining from over night, and of the superabundant secretion of the gastric mucous glands (as distinguished from the pepsine glands), by the action of the Elizabeth or Ludwig springs, the patient should be directed to reduce the quantity of coffee or tea at breakfast to the utmost limit; as also not to drink at table more than a given allowance of water, in order to avoid swamping the already flabby organ, and precluding absorption of albuminoids.

*Wine and other fermented liquors* have from time immemorial formed the favourite subject of dietaries at watering places like Homburg. Here again, I contend that there are no rules for all comers. In abstract

principle, there is nothing to forbid, at a time of day conveniently distant from the hours of drinking at the wells, the moderate use of almost any sound wine or beer, the lighter Hocks and Medocs and pale German beer more especially. In gouty and dyspeptic visitors, however, nothing deserves so much the attention as the amount and quality of their daily drink while undergoing any mineral water treatment. If I am concurring in the opinion of Sir Alfred Garrod as to the danger existing in strong alcoholic wines, such as Marsala and the Peninsular ones, and of ale and stout, in producing and fostering gout, it is principally from my own experience that these beverages, with their considerable amount of unfermented matter and alcohol, become a check to digestion, when introduced into the stomach of those invalids. Since nothing is of greater importance to them during their stay at Homburg than to secure an uninterrupted progress and final completion of their course, preference ought to be given to Rhenish wines and light Medocs that have been bottled for not less than four years. A few observations

appear appropriate here in defence of these light beverages, the prevailing idea being in England that they produce acidity.' Even if this were the case, the condition of acidity, as being symptomatic of indigestion and dyspepsia, must be supposed to have pre-existed and to be only brought to the surface by the small quantity of wine, as it might have been by a hundred other causes. Nothing is more apt to prove the correctness of this view than the fact that Hock, for example, which may have been obnoxious to a patient for a time, often agrees again with his stomach and is perfectly assimilated, after the digestive organs have been set right by a few weeks course at Homburg; or perhaps by diet alone.

The difficulty of dealing with the question of stimulants arises principally from the fact that with many it has become so much a habit as to appear a necessity. We take the case of a man of 30. or 35 years old with the element of gout threatening to become active: in ninety nine out of a hundred of such cases the medical man is bound to prohibit all alcoholic beverages; yet he may

think himself justified, in the case of a patient of greater age and of temperate habits, in permitting him daily to introduce into his system just a little wine or beer, *i. e.* perhaps just enough to interfere with the proper digestion of his food. The immediate effect of these stimulants may be very pleasant, and no real excess may be committed; still we must, particularly in constitutions with a hereditary taint, or with an inclination to dyspepsia, sooner or later expect to see the »cumulative« effect show itself. This may be in the shape of a dyspeptic attack, or one of gout, or of the development of obesity of a general character, and still the patient may remain under the delusion that, whatever else he may be ordered to do, he cannot forsake that small amount of wine or beer, so useful to him as a daily comforter. For this class of people I admit such stimulants only under the head of temporary medicines, and would ask grumbling clients: What would you think of me, if I asked you to take digitalis or colchicum twice daily with your meals?

I must also regard the regular use of spirits as a substitute for wine at table, which has become the fashion in England, as a measure fraught with danger. The patient may for a time experience relief when told to leave off wine and take to himself a moderate quantity of brandy and whiskey in water with his meals; and he is almost sure to continue this practice, till another of those habits has been established, which interfere with digestion, by checking fermentation and retarding all other physiological action of the stomach.

Here it is the medical man's task — a task he cannot shirk — to break habits and restore to nature her rights, and nowhere can this be done better than at a place like Homburg and under the influence of a water whose digesting properties permit the patient more easily to dispense with the artificial stimulus of wine and other drinks.

Never should a mineral water treatment, able as it is to influence the whole system, be undertaken, before the patient has realized the necessity of a thorough change of diet in this respect. Obesity cannot be treated

at a mineral watering place by anything short of total abstinence in alcoholic drinks; gout requires judicious restriction in wine and beer; dyspepsia incurs great risks of acute relapses, if the stomach is not kept almost entirely free from any such stimulants at the time.

EXERCISE. The old notion of a great deal of exercise being paramount in the digestion of our mineral waters, has had to undergo important alterations. It began to fall when smaller doses of water became the order of the day instead of the large quantities of former periods. Latterly moreover we have come to understand, that the natural acidity and digestive quality of the gastric juice becomes diminished immediately and for some little time after the performance of any great physical exercise; and this is why the indulgence in sports just before dinner may lead to dyspepsia. In prescribing for his patient the requisite amount of exercise, the physician has to shape his course according to the present condition of the individual, and the kind of water treatment ordered. Thus the obese, the sufferer from acquired gout or the one threatened with it, the sufferer from chronic



rheumatism, ordinary dyspepsia, haemorrhoids or plethora, must be told to walk a great deal more than the one afflicted with hereditary gout, neurotic dyspepsia, anaemia or jaundice. But while all the latter class can still trot down to the wells and there take a moderate amount of exercise between the glasses, certain other patients may, from age or debility, have to drink the waters at home; others again, such as the victims of heart disease, paralysis, bronchitis, will only be allowed a certain strict measure of walking or driving, at a time not interfered with by their drinking or bathing occupations.

As an illustration of the importance to avoid any looseness in advice on a matter apparently so plain as exercise, I may point out the widely different effect of horse exercise on arbitrary constipation. In persons who are not habitual riders, but merely resort to this exercise for the purpose mentioned, any violent and protracted practice will have the opposite effect of what was desired, while easy walking, cantering or trotting seldom fails to restore defective peristaltic action.

It has formed the subject of instruction

for myself and of amusement for my clients, to check their daily perambulations by means of a pedometer. I found the ordinary walk under the drinking at the wells in the morning, a visit to the Kaiser Williams baths in the forenoon and a quiet stroll in the afternoon to amount to four to five miles.

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# Register.

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- Absorption by the system  
  of the waters 23.  
  of the salts 20.  
  of iron 72.  
Acidity 38, 99.  
Alkalines  
  in hyperacidity 43.  
  in biliary catarrh 45.  
  in the gouty state 65, 68.  
  in rheumatritis 80.  
  in gravel 69.  
Anemia 38, 42, 75.  
Arterial trouble 85.  
Arthritis deformans 78.  
Auto-infection 48.  
Basaltic upheavals 4.  
Beer 98.  
Blood-testing 58, 76.  
Blood corpuscles 72, 76.  
Carbonic acid 7, 8.  
  in the bath water 32.  
  in the waters and wells 34.  
  action on veins etc. 18.  
Capillary changes 85.  
Carlsbad 18, 19, 52.  
Chlorosis 73.  
Chloride waters compared to  
  the sulphate ones 19.  
Climate 73, 79.  
Colon 22, 52.  
Constipation 50.  
Corpulence 54.  
Density of blood raised by the  
  chlorides 25.  
Diabetes 61.  
Diaphragm set free 57.  
Dilatation  
  of the stomach 38, 96.  
  of the heart 86.  
Drink 96.  
  restricted 58, 96.  
Draining 57, 59, 97.  
Dyspepsia 36, 39, 96.  
Electricity 41, 44, 54.  
Elimination  
  as a general effect 17, 88.  
  in gout 65, 68.  
Enteroptosis 44.  
Exercise 102.  
Excretion of urea etc. 24.  
Exosmosis 22.  
Food 91.  
Frederick the Great on Gout 62.  
Gastric catarrh 37, 99.  
Gastric digestion quickened 38.  
  slackened by alcoholics 98,  
  100, 101.  
  by over-exertion 102.

- Gout 62.  
Gravel 64, 69.  
Heart  
    the irritable 74, 75.  
    the fatty 84.  
    the gouty 85.  
Headache and giddiness caused  
    by the waters 26.  
Hemoglobine 76.  
Hemocytometer 58.  
Horace on dropsy 59.  
Hydragogue action of the  
    chlorides 25.  
Hyperacidity of gastric juice 42.  
Intestinal catarrh 45.  
Irritant action of the waters 23.  
Irritable stomach 40.  
Kidney, the gouty, acted upon,  
    27, 60, 71.  
Kissingen 19, 26, 30, 52, 82, 90.  
Kreuznach 30, 88, 90.  
Liebig's law of absorption 21.  
Liver  
    biliousness 48.  
    chronic enlargement 46.  
    gall stones 44.  
Locomotor ataxia 78.  
Lower Devonian 1.  
Marienbad 18, 52, 56.  
Massage 52.  
Metabolism 65 (note), 67, 71.  
Mudbaths 35.  
Nauheim 76, 82.  
Nervous system 76.  
Neurasthenia 77.  
Neurotic dyspepsia 39, 77.  
Neurotic dystrophies 78, 89.  
Neurotic patients 41.  
Obesity 54.  
Omentum 57.  
Pedometer 104.  
Pine baths, their general effects  
    on invalids 35.  
Paralysis 76.  
Pyrmont 73.  
Quarzite 2.  
Rehme 76.  
Reichenhall 90.  
Rheumatthritis 78, 80.  
Schwalbach 73.  
Scrofula 90.  
Sigmoid flexure 52.  
Soup 95.  
Spa 73.  
Sphygmograph 31, 83.  
Taunus, description of its  
    strata 1.  
Temperature of the waters as  
    drunk at the wells 29.  
Tissue change 67, 71.  
Tumours, uterine 89.  
Uric acid, theories on its for-  
    mation 62, 63, 64.  
Vichy 32.  
Weight 28, 57, 60.  
Wet packs 51, 88, 91.  
Wiesbaden 30.  
Wine 98.

# Contents.

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	page
Preface . . . . .	III
Outlines of geology . . . . .	1
Origin of the sources . . . . .	3
Water supply of Homburg . . . . .	8
Description of the sources . . . . .	11
Synoptical table comparing the Homburg waters with the chief Kissingen source . . . . .	15
Action of waters on the system . . . . .	17
The baths and their effect on the system . . . . .	30
Medicinal effect of the waters . . . . .	36
Dyspepsia . . . . .	36
Gastric catarrh and atonia . . . . .	37
Neurotic dyspepsia . . . . .	39
Gastro-biliary catarrh and gallstones . . . . .	44
Intestinal catarrh and abdominal plethora . . . . .	45
Chronic enlargement of the liver . . . . .	46
Biliousness . . . . .	48
Constipation . . . . .	50
Obesity . . . . .	54
Diabetes . . . . .	61
The gouty state . . . . .	62
Anemia . . . . .	71
Nervous system and nodose arthritis . . . . .	76
Diseases of the heart and acute rheumatism . . . . .	80
Uterine disturbances . . . . .	87
Scrofula . . . . .	90
Diet . . . . .	91

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## Erratum.

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Page 10 — line 6 *read 22 instead of 35.*

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# SYNOPTICAL TABLE

SHOWING THE PROPORTION OF THE PRINCIPAL INGREDIENTS OF THE HOMBURG SPRINGS AND THE KISSINGEN RAKOCZY

Elizabeth	Chlorides 10.413			
	Bicarbonate of Lime 2.176			
	Bicarbonate of Iron 0.0248			
	Carbonic acid 1407			
Kaiser	Chlorides 8.243			
	Bicarbonate of Lime 1.329			
	Bicarbonate of Iron 0.0248			
	Carbonic acid 1706			
Stahl	Chlorides 6.55			
	Bicarbonate of Lime 1.040			
	Bicarbonate of Iron 0.0435			
	Carbonic acid 1283			
Rakoczy	Chlorides 6.50			
	Bicarbonate of Lime 1.060			
	Bicarbonate of Iron 0.0315			
	Carbonic acid 1305			







